TECHNICAL NOTES

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Snow Accumulation Under Red Pine of Different Stand Densities in Lower Michigan

The winter snowfall accumulation under a red pine plantation in northern Lower Michigan was found to vary with stand density, according to data collected for the winters of 1953-54, and 1954-55. The late winter snow depth averaged 11, 9, and 8 inches under stand densities of 80, 120, and 190 square feet of basal area per acre respectively, whereas the depth at an adjacent open field station was 17 inches.

The red pine plantation under study was established in 1912 by the Michigan Department of Conservation near Higgins Lake in Crawford County, Michigan. The soil is classed as Grayling sand. Available soil moisture for tree growth becomes critical by midsummer.

By 1951, the stand density in terms of basal area had reached 190 square feet per acre. In that year, 2-acre compartments were thinned to 6 different levels of stocking that ranged from 60 to 160 square feet of basal area per acre.

During January to March 1954 and in February 1955, the snow depth was measured in the compartments thinned to stand densities of 80 and 120 square feet and in the unthinned portion having 190 square feet of basal area per acre. Altogether 15 snow depth measurements were taken at each of three stations in each compartment and at the open station in the adjacent field during the two winters. The topography was exceptionally level so that slope and exposure had no effect on the snow depth measured.

The measurements obtained show that the depth of snow accumulation decreased as the density of the stand increased (fig. 1). The snow intercepted by the tree crowns was lost by evaporation and sublimation.

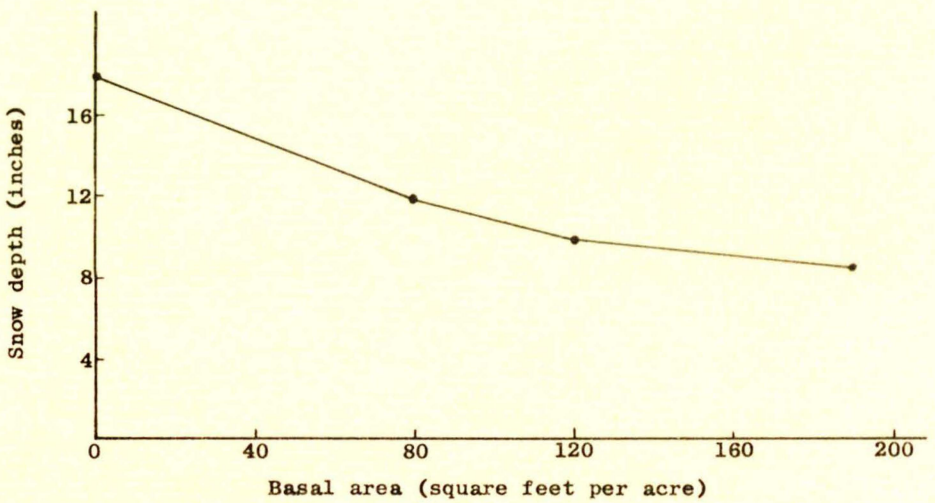

Figure 1.--Average late winter snow depth accumulation in the open and under a 45-year-old red pine plantation at varying stocking levels.

(over)

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The shelter afforded by the plantation also slowed the rate of snowmelt in the spring season; the snow remained 1 to 2 weeks longer here than in the open field.

Thinning dense red pine plantations is normally expected to provide more growing space and more available soil moisture for the remaining trees in the stand. Decreasing the stand density by thinning also increases the amount of precipitation reaching the soil.

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